BenchMark Wireline Products
36220 FM 1093
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ALS6A606 HOISTMAN DISPLAY PANEL

DEPTH - SPEED - TENSION
DATA ACQUISITION – WATERPROOF
ATEX ZONE 2/ CLASS I DIVISION 2

Operations and Maintenance Manual

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1.0 GENERAL DESCRIPTION

1.0 GENERAL DESCRIPTION continued

1.0 GENERAL DESCRIPTION continued

This apparatus is suitable for use in: Class I, Division 2, Groups A THRU D, Temp code T6, Rated operational temperature: -20C < TA < 40C.

This is a type IP54 Enclosure.

The BenchMark Wireline Compact Hoistman's Display Panel is designed to be an independent depth, tension and line speed measurement display panel. The panel is designed to be mounted inside or outside of a wireline unit and connect to a measuring head. It will work with all the BenchMark AM5K, AM3K and Slickline measuring heads. The panel can be used as a secondary (backup) display for these devices.

Depth input comes from either an optical encoder or a BenchMark backup sensor.

Tension input comes from either an electronic load pin or a pressure transducer connected to a hydraulic gauge.

The panel provides encoder and tension outputs. It also provides an output to connect to an 0-1ma electrical tension meter.

The unit is powered by six internal rechargeable batteries. It can be connected to an external AC or DC power source to keep the batteries charged. The batteries are trickle charged when external power is connected to the unit. The batteries are fully charged after 3 hours. The batteries will discharge if the unit is left unpowered.

WARNING – DO NOT USE PRIMARY CELLS

1. Primary coin cell battery
   Panasonic CR1632
   One cell rated 3V, LiMnO2
   Capacity 140mAh

2. Battery Pack (6 Rechargeable batteries)
   Energizer NH15
   6 batteries with 1.2V, NiMH
   Capacity each battery 2300mAh

The panel has a built-in data recorder that stores depth and line speed data in ascii text format. The panel also has a built-in internal clock that runs continuously whether powered up or not. This clock is used to provide a time and date stamp for every data record.

A USB port is provided as a means to upgrade the internal software and to retrieve data stored internally.

2.0 SAFETY & CERTIFICATES

SAFETY WARNINGS

This apparatus is suitable for use in ATEX Zone 2 Locations.

This apparatus is suitable for use in Class I, Division 2, Groups A, B, C, & D Hazardous (Classified) or Unclassified Locations.

WARNING – DO NOT OPEN WHEN ENERGIZED.

WARNING – DO NOT SEPARATE CONNECTIONS WHEN ENERGIZED.

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR ATEX Zone 2 LOCATIONS.

AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANT PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES ATEX Zone 2 LOCALES.

WARNING - EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;

AVERTISSEMENT - RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOW TO BE NON-HAZAROUS;

AVERTISSEMENT – RISQUE D'EXPLOSION – AVANT DE DECONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.

WARNING – EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS;

AVERTISSEMENT – RISQUE D'EXPLOSION – AFIN D'EVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DISIGNE NON DANGEREUX AVANT DE CHANGER LA BATTERIE.

WARNING – EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES FO THE MATERIALS USED IN THE FOLLOWING DEVICES: P8-9000062.

AVERTISSEMENT - L'EXPOSITION A CERTAINS PRODUITS CHIMIQUES PEUVENT DEGRADER LES PROPRIETES D'ÉTANCHÉITÉ DES MATÉRIAUX UTILISÉS DANS LES DISPOSITIFS SUIVANTS : P8-9000062.

WARNING - PROTECTION MAY BE IMPAIRED IF THIS DEVICE IS USED IN AN APPLICATION OR MANNER NOT SPECIFIED IN THE MANUAL

2.2 CERTIFICATES

2.2.1 ATEX STANDARDS & REQUIREMENTS

PRODUCT CERTIFICATION & CODING

EN 60079-0: 2012, 6th Edition
EN 60079-15: 2010, 4th Edition
ITS14ATEX47947X
CEo359 Ex II 3 G
Ex nA nC IIC T6 Gc
-20C<= Tamb <= +40C, IP54
Intertek ITS14ATEX47947X

INSTALLATION INSTRUCTIONS

Warnings:

Must be installed per manufacturer's instructions and National Installation Regulations (i.e. EN 60079-15:2010 and EN 60079-17)

- The apparatus is ATEX CAT3, only to be installed in Hazardous Area Zones 2.
- The installer is to ensure that the equipment is located in areas that are known not to have an adverse effect on the housing material.
- Do not modify the enclosure as this will compromise the apparatus certificate.

Hazardous Area Installation Standards & Requirements:

The installer should refer to the latest edition of the following standards before operating in a Hazardous Area:

Conforms to:

ANSI/UL 61010-1-2012

ANSI/UL 50-2012

ANSI/UL 50E-2012

ANSI/ISA 12.12.01-2012

Certified to:

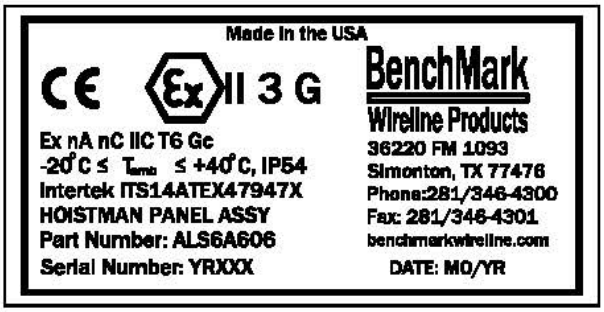
CAN/CSA C22.2 No. 61010-1-12

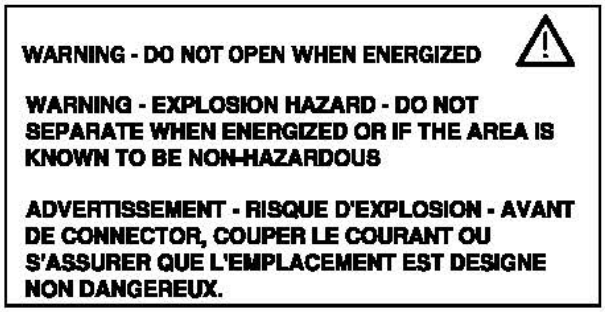
CAN/CSA C22.2 No. 94.1-12

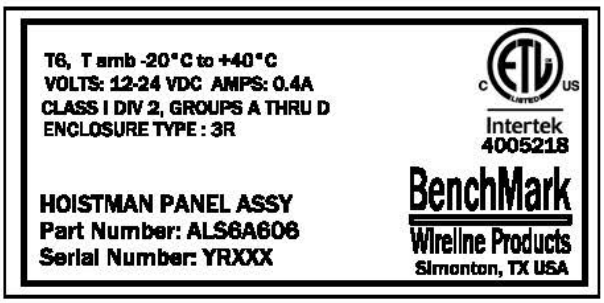
CAN/CSA C22.2 No. 94.2-12

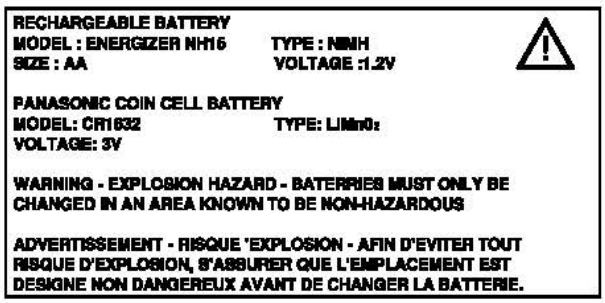
CAN/CSA C22.2 No. 213-M1987 (R2013)

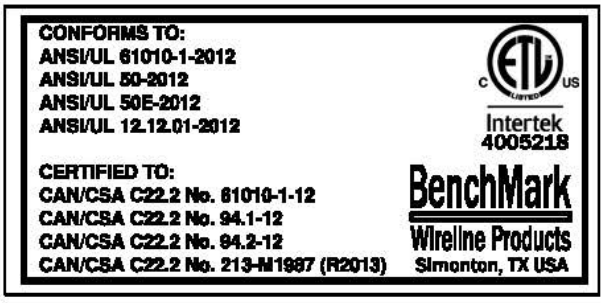
ATEX and North American Listing Certification Label Details and Information

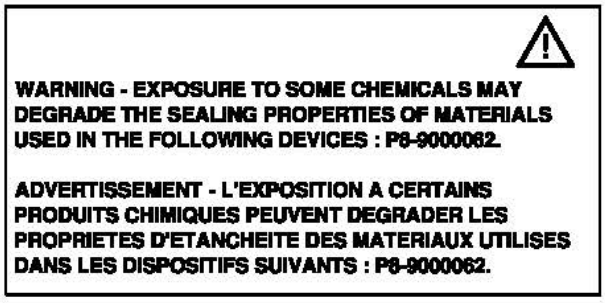



WARNING - DO NOT OPEN WHEN ENERGIZED
WARNING - EXPLOSION HAZARD - DO NOT SEPARATE WHEN ENERGIZED OR IF THE AREA IS KNOWN TO BE NON-HAZARDOUS
ADVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE CONNECTOR, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.




RECHARGEABLE BATTERY
MODEL : ENERGIZER NH15
TYPE : NiMH
SIZE : AA
VOLTAGE :1.2V
PANASONIC COIN CELL BATTERY
MODEL: CR1632
TYPE: LiMn0₂
VOLTAGE: 3V
WARNING - EXPLOSION HAZARD - BATERRIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS
ADVERTISSEMENT - RISQUE 'EXPLOSION - AFIN D'EVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX AVANT DE CHANGER LA BATTERIE.




WARNING - EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICES : P8-9000062.
ADVERTISSEMENT - L'EXPOSITION A CERTAINS PRODUITS CHIMIQUES PEUVENT DEGRADER LES PROPRIETES D'ETANCHEITE DES MATERIAUX UTILISES DANS LES DISPOSITIFS SUIVANTS : P8-9000062.

2.2.2 CLASS 1 DIVISION 2 CERTIFICATE

Intertek

AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	BenchMark Wireline Products Inc 36220 FM 1093	**Manufacturer:**	BenchMark Wireline Products Inc 36220 FM 1093
Address:	PO Box 850 Simonton, TX 77476	**Address:**	PO Box 850 Simonton, TX 77476
Country:	USA	**Country:**	USA
Contact:	Mr. Kenneth Dusek	**Contact:**	Mr. Kenneth Dusek
Phone:	(281) 346-4300	**Phone:**	(281) 346-4300
FAX:	(281) 346-4301	**FAX:**	(281) 346-4301
Email:	kdusek@benchmarkwireline.com	**Email:**	kdusek@benchmarkwireline.com

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Dallas, TX

Control Number: 4005218 **Authorized by:** Catherine Dwyer

for Thomas J. Patterson, Certification Manager

C ETL LISTED US
Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

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545 East Algonquin Road, Arlington Heights, IL 60005
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Fax: 281.346.4301
benchmarkwireline.com

Intertek

AUTHORIZATION TO MARK

Standard(s):	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements, ANSI/UL 61010-1-2012 and CAN/CSA C22.2 No. 61010-1-12, Third Edition, Issued: May 11, 2012 Standard for Safety for Enclosures for Electrical Equipment, Non-Environmental Considerations, ANSI/UL 50-2007 (R2012), Twelfth Edition, Issued: September 4, 2007, Revised: April 27, 2012 Standard for Safety for Enclosures for Electrical Equipment, Environmental Considerations, ANSI/UL 50E-2007 (R2012), First Edition, Issued: September 4, 2007, Revised: April 27, 2012 Enclosures for Electrical Equipment, Non-Environmental Considerations, CAN/CSA C22.2 No. 94.1-07 (R2012), First Edition, Issued: September 4, 2007, Revised: April 27, 2012 Enclosures for Electrical Equipment, Environmental Considerations, CAN/CSA C22.2 No. 94.2-07 (R2012), First Edition, Issued: September 4, 2007, Revised: April 27, 2012 Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, ANSI/ISA 12.12.01-2012, Approved: July 9, 2012 Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations, CAN/CSA C22.2 No. 213-M1987, March 01, 1987, Reaffirmed 2013
Product:	Hoistman Display Panel for Ordinary and Hazardous Locations: Class I, Division 2, Groups A, B, C, and D, T6 Ambient Temperature: -20°C < Ta < 40°C
Brand Name:	BenchMark
Models:	ALS6A606

2.2.3 ATEX ZONE 2 CERTIFICATE

Intertek

1. **TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3. **Type Examination Certificate Number:** ITS14ATEX47947X

4. **Equipment or Protective System:** Hoistman Display Panel, Model ALS6A606

5. **Manufacturer:** BenchMark Wireline Products, Inc.

6. **Address:** 36220 FM 1093, Simonton, TX 77476, USA

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Intertek Testing and Certification Limited certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive 94/9/EC of 23 March 1994

   The examination and test results are recorded in confidential Intertek Report 100912419DAL-002, dated October 15, 2014.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards EN 60079-0:2012 and EN 60079-15:2010 except in respect of those requirements referred to at item 16 of the Schedule.

10. If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11. This Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include the following:-

    Ex II 3 G Ex nA nC IIC T6 Gc

    -20°C ≤ Ta ≤ 40°C, IP54

Intertek Testing & Certification Limited
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Tel: +44 (0)1372 370900 Fax: +44 (0)1372 370977
www.intertek.com

Thomas a. Crawford
Certification Officer
20 October 2014

Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

This certificate may only be reproduced in its entirety and without any change, schedule included and is subject to Intertek Testing and Certification's Conditions for Granting Certification.

Sheet 1 of 3

ExF-301 - Type examination certificate Template Revision 4 RFT-EU-NB-OP-23I 5-23-14

Intertek

SCHEDULE

TYPE EXAMINATION CERTIFICATE NUMBER ITS14ATEX47947X

13. **Description of Equipment or Protective System**

ALS6A606 Hoistman Display Panel covered by this certificate is permanently mounted data acquisition unit (depth, tension and line speed measurement) suitable for indoor and outdoor locations. The product is provided with plug-in connectors which ratings are noted below, and with end product user interface consisting of display and four accessible push button switches for control purposes.

- 12-24V DC, 0.4A (receptacle with 3 pin connector for main input power)
- 5V USB Connector (receptacle with USB connector used for data download purposes; to be used in non-hazardous areas only)
- Encoder (receptacle with 6 socket connector for input data coming from the encoder)
- Tension (receptacle with 10 socket connector for input data coming from the tension sensor)
- Sig Out (receptacle with 10 pin connector for output data going to the processing unit)

Product can be powered via two different options:

- 12-24V DC, 0.4A
- Battery Pack 6 x 1.2V NiMH, 2300mAh, AA rechargeable batteries (Energizer NH15)

14. **Report Number**

Intertek Report Ref: 100912419DAL-002, dated October 15, 2014.

15. **Conditions of Certification**

(a). Special Conditions for safe use

- To maintain the safety during installation of the Hoistman Display Panel (ALS6A606), the metal enclosure must be properly earthed or bonded to other earthed metal parts in order to reduce the risk of ignition. Unearthed metal parts could be susceptible to electrostatic charges that could become a source of ignition.
- USB port is not intended for use in hazardous locations. This port is provided as a means to upgrade the internal software and to retrieve data stored internally when the area is known to be non-hazardous only.
- The following WARNINGS shall be noted and adhered to:
  WARNING – DO NOT OPEN WHEN ENERGIZED
  WARNING – DO NOT SEPARATE WHEN ENERGIZED

(b). Conditions of Manufacture

- Electric Strength Test in accordance with 23.2.1 of EN 60079-15

  A dielectric strength test shall be carried out in accordance with 6.5.1 of EN 60079-15: 2010. Alternatively, the test shall be carried out at 1,2 times the test voltage, but shall be maintained for at least 100 ms. All products covered by this Report with test potential applied between input circuits and the metal enclosure.

This Certificate is the property of Intertek Testing and Certification Ltd and is subject to Intertek Testing and Certification's Conditions for Granting Certification.

SCHEDULE

TYPE EXAMINATION CERTIFICATE NUMBER ITS14ATEX47947X

16. **Essential Health and Safety Requirements (EHSR's)**

The relevant EHSR's have been identified and assessed in Intertek Report Ref: 100912419DAL-002E, Issue: 01, Dated: August 26, 2014

17. **Drawings and Documents**

Title	Drawing No.:	Rev. Level:	Date:
LABELING HOIST PNL BATT BKUP ATEX ZONE 2 / C1D2	ALS6M696	B	26-Aug-2014
PCB ASSY DEPTH SPEED BKUP ZII BENCHMARK WIRELINE PRODUCTS	ALS6A620	E	9-Apr-2014
Bill of Material	Parent: ALS6A620E	--	11-Apr-2014
PANEL AMS BATTERY BACKUP Z2 DEPTH/SPD/TENS WATERPROOF	ALS6A606	A	22-Jan-2014
Bill of Material	Parent: ALS6A606	--	11-Apr-2014
PANEL FRONT DEPTH/SPEED/TENSION BACKUP	ALS6M601	A	22-Jan-2014
CHASSIS DEPTH/SPEED/TENSION BACKUP	ALS6M603	A	22-Jan-2014
CLAMP LENS DEPTH/SPEED/TENSION BACKUP	ALS6M623	A	22-Jan-2014
PANEL REAR DEPTH/SPD/TEN WP DC ONLY BACKUP	ALS6M662	A	22-Jan-2014
CLAMP BATTERY 6 X AA BACKUP TENSION	ALS8M037	A	26-Jan-2009
Operations and Maintenance Manual	ALS6A606 PANEL	--	Aug-2014

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

Intertek Testing & Certification Limited
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Registered No 3272281 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex, CM14 5NQ.

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3.0 OPERATING PROCEDURES

3.1 Turn the unit on by pressing the power button.

3.2 The ALS6A606 has 2 modes of operation. When the panel is turned on the board is initialized, the flash card is started and read, and the USB connections are initiated. In this mode, the data files can be transferred or deleted using the USB interface. The time can be reset by editing howtoset.txt and saving it as timedate.txt. The board can be reprogrammed by copying the new hex file to the flash disk and renaming it 'programe.hex'. When the '+' button is pushed the controller looks for either of these two files and if found resets the time or reprograms the board. The controller then deletes these files and enters the logging mode. Select the appropriate settings from the menu (see section 4.0)

The logging mode lets you select head type, line size, encoder PPR, etc. There is also a head 'OTHER' that lets you enter mV/V tension sensitivity, full scale tension, and wheel circumference.

3.3 Set the depth to the proper value by using the menu +/- button or to 0 by pressing the zero switch.

3.4 The system is now ready to measure depth and/or tension.

4.0 DESCRIPTION OF FEATURES

4.1 POWER BUTTON

Use this button to turn on the panel. The panel can be turned off by selecting shutdown in the menu or by pushing menu, +, and - button simultaneously.

4.2 MENU SWITCH

This button is used to change the internal settings of the panel. These settings include Measuring Head type, Line Size settings, Load Cell Angles, English/Metric units, Depth adjust (auto add/subtract), etc. Refer to section 4 for detailed description of these features.

4.3 + BUTTON

Use this button in the menu to add or modify parameters

4.4 - BUTTON

Use this button in the menu to subtract or modify parameters

5.0 MENU SELECTIONS

The internal settings of the panel can be set by pressing the menu button.

To change a setting, press and release the menu button until the desired setting is displayed. Use the +/- switch to change the setting.

There are four different menus, one for each of the different type of measuring systems.

Measuring Heads
- MP16
- 5KABU
- 5K
- 3K
- MAKO/ORCA
- MMOUTH/Dolphin
- Shark
- Other

To change the head type, press the menu button until Hd is displayed. At this time press the +/- button until the desired head type is selected. Press + then the menu button again to accept the setting.

Each head type has a different menu. Following are the available settings for each.

The menu has the following options:

1) zero tension: + button to zero tension

2) tension shunt cal: This shunts the load cell by pulling the shunt cal pin to ground. This menu selection will not time out. You must advance or go backwards in the menu.

3) tn shut dn: This is the tension at which the shutdown relay is turned on. The relay is rated at 200V and 5A. When the tension is reduced below the shutdown value the transistor is reset. Raising the shutdown value above the current tension will also release the transistor.

4) DiffTn Sca: The differential tension scale determines the meter scale and the diff tension display. For instance, if the differential scale is set to 1000#, each '>' displayed would be 100# increase and each '<' would indicate a 100# decrease from the reference, and the meter full deflection would indicate 1000# change from the reference. The reference is zeroed by pushing the '+' button.

5) tn shim: This value is multiplied by the tension measured for tension display. The range is .5 to 1.5. If 1.5 is selected 1000# measured by the panel would be displayed as 1500#.

6) zero depth: Pressing the '+' button zeroes the depth.

7) set depth: Use the '+' and '-' buttons to set the depth

8) speed minutes/hours: Use the '+' and '-' buttons to select distance/min or distance/hr

9) head: Use the plus and minus buttons to cycle through the selections and choose the correct head. The choices are:
SHARK, MMOUTH/DOLPHIN, MAKO/ORCA, AM3KA, AM5KA, 5KABU, MP16,OTHER

10) shim: Enter the ft/mt per 1000 ft/mt you want added or subtracted from the measured depth. -.2 would subtract 2 feet at 10000ft.

11) UP DN normal/reverse: If the panel is indicating the wrong direction, changing this will reverse the direction displayed

12) Stretch/Standard Depth: Choose the depth to be displayed. Standard depth has no tension input. Stretch depth backs out the tension going in the hole and uses the line weight to determine tool weight and these two are multiplied by the stretch coefficient and no tension tool depth to compute a 'stretch' depth.

13) wireline: Choose the wireline or slickline measuring device in use. The choices are SHARK MMOUTH_DOLPHIN: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4
MAKO/ORCA: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4, 5/16
AM3K: 3/16, 7/32, 1/4, 9/32, 5/16, 3/8
AM5K: 3/16, 7/32, 1/4, 9/32, 5/16, 3/8, 7/16, 15/32, 472ht, 484ht, 492ht
MP16: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4, 5/16

14) If head 'OTHER' is selected 'hd_circ' is displayed. Enter the circumference in feet of the 'OTHER' head.

15) If head 'OTHER' is selected 'Other mV/V' is displayed. Enter the value in mV/V of the 'OTHER' load cell.

16) If head 'OTHER' is selected 'Oth LC FS' is displayed. Enter the value of the 'OTHER' load cell full scale.

17) dpth unit meters/feet Use the plus and minus button to choose meters or feet

18) tension unit lbs/kgm Use the plus and minus button to choose lbs or kgm

19) ncodr ppr Use the plus and minus button to enter the encoder pulses per revolution

20) This menu position displays the battery voltage, external voltage and charge current. The charger can be started with the “+” button and stopped with the “-“ button if desired.

The panel will automatically charge when battery voltage falls below a set level.

21) Record new/all: This selects data written to the flash card. New writes to the flash when the depth changes more than .1 feet or the tension chagnes more than 10#. All writes a record every second.

22) Shutdown->Plus: Pushing the plus button turns off the panel.

5.1 3K MODE

This mode is for a BenchMark AM3K cased hole measuring head.

The available menu selections in AM3K mode are:

LINE SIZE SETTINGS (LS)
Select the size of the cable you will be using. This setting will adjust the wheel size to account for the size of cable.

The available sizes are:

3/8, 5/16, 9/32, 1/4, 7/32

The wheel size settings for each are:

3/16” cable - 2.014 ft.
7/32" cable - 2.017 ft.

1/4” cable - 2.020 ft.
9/32" cable - 2.023 ft.
5/16" cable - 2.026 ft.
3/8" cable - 2.031 ft.

DEPTH ADJUST (Adj)
This setting is comparable to shimming a wheel. The amount selected will automatically be added or subtracted from the depth input. The values are feet / thousand.

DEPTH UNITS (UN)
This setting is used to set the display readout units to either FEET or METERS.

DIRECTION (dir)
This setting is used to reverse the counting direction. The depth should be increasing as you are going into the hole and decreasing as you are coming out of the hole. If it is going the opposite direction, use this setting to change it.

5.2 5K mode

No wheel size selections are available. It is set for 2’. Use the setting for any straight-line measuring device that uses a 2 foot measuring wheel.

The available menu selections in AM5K mode are:

DEPTH ADJUST (Adj)
This setting is comparable to shimming a wheel. The amount selected will automatically be added or subtracted from the depth input. The values are feet / thousand.

DEPTH UNITS (UN)
This setting is used to set the display readout units to either FEET or METERS.

DIRECTION (dir)
This setting is used to reverse the counting direction. The depth should be increasing as you are going into the hole and decreasing as you are coming out of the hole. If it is going the opposite direction, use this setting to change it.

5.3 SL mode

This mode is used for a BenchMark slickline sytem using a 4’ counter wheel.

The available menu selections in SL mode are:

LINE SIZE SETTINGS (LS)
Select the size of the cable you will be using. This setting will adjust the wheel size to account for this size of cable.

The available sizes are:

SHARK MMOUTH_DOLPHIN: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4
MAKO/ORCA: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4, 5/16
MP16: 092, 108, 125, 140, 150, 160, 3/16, 7/32, 1/4, 5/16
AM3K: 3/16, 7/32, 1/4, 9/32, 5/16, 3/8
AM5K: 3/16, 7/32, 1/4, 9/32, 5/16, 3/8, 7/16, 15/32, 472ht, 484ht, 492ht

DEPTH ADJUST (Adj)
This setting is comparable to shimming a wheel. The amount selected will automatically be added or subtracted from the depth input. The values are feet / thousand.

DEPTH UNITS (UN)
This setting is used to set the display readout units to either FEET or METERS.

DIRECTION (dir)
This setting is used to reverse the counting direction. The depth should be increasing as you are going into the hole and decreasing as you are coming out of the hole. If it is going the opposite direction, use this setting to change it.

5.4 OTHER (OtH)

This menu is to be used if you have a measuring device with a different wheel circumference than the standard Kerr measuring devices.

No line size selections are available

The available menu selections in the OTHER menu are:

WHEEL CIRCUMFERENCE (Cr)

This setting represents the circumference of the measuring wheel. Use the +/- switch to adjust the setting to match the circumference of the measuring wheel you are using.

DEPTH ADJUST (Adj)
This setting is comparable to shimming a wheel. The amount selected will automatically be added or subtracted from the depth input. The values are feet / thousand.

DEPTH UNITS (UN)
This setting is used to set the display readout units to either FEET or METERS.

DIRECTION (dir)
This setting is used to reverse the counting direction. The depth should be increasing as you are going into the hole and decreasing as you are coming out of the hole. If it is going the opposite direction, use this setting to change it.

6.0 INSTALLATION AND MOUNTING

6.1 INSTALLATION PROCEDURE

6.1.1 Prepare an appropriate panel cut-out with four fixing holes (refer to drawing in section 6.1) or use one of the two mounting brackets shown below (section 5.2).

6.1.2 Connect the magnetic pickup cable to the rear of the unit.

6.1.3 Ensure that power is off. Connect the unit to a 12vdc.

6.1.4 Insert the display unit into the panel and secure it at the four corners.

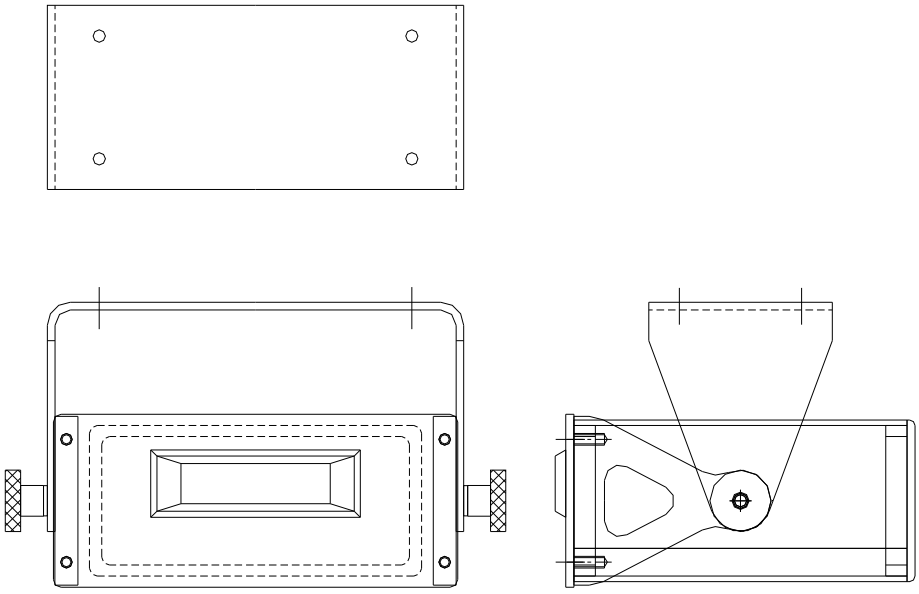
6.1.5 Check that the magnetic pickup signal has the correct polarity. Move the measuring wheel in the direction of positive depth (down). If the display shows a negative value, it can be corrected by rotating the magnetic pickup on the measuring head by 180 degrees or changing the direction using from the menu.

6.1.6 Ensure that the unit is setup for the desired measurement units (feet or meters).

Before you start to use the display unit, leave it connected to the external power for 4 hours to ensure that the batteries are fully charged.

6.2 MOUNTING KITS

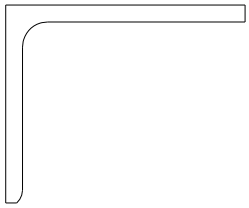
6.2.1 AMS4A161 PIVOTING MOUNT



6.2.2 AMS4M110 PLATE MOUNT

TOP VIEW

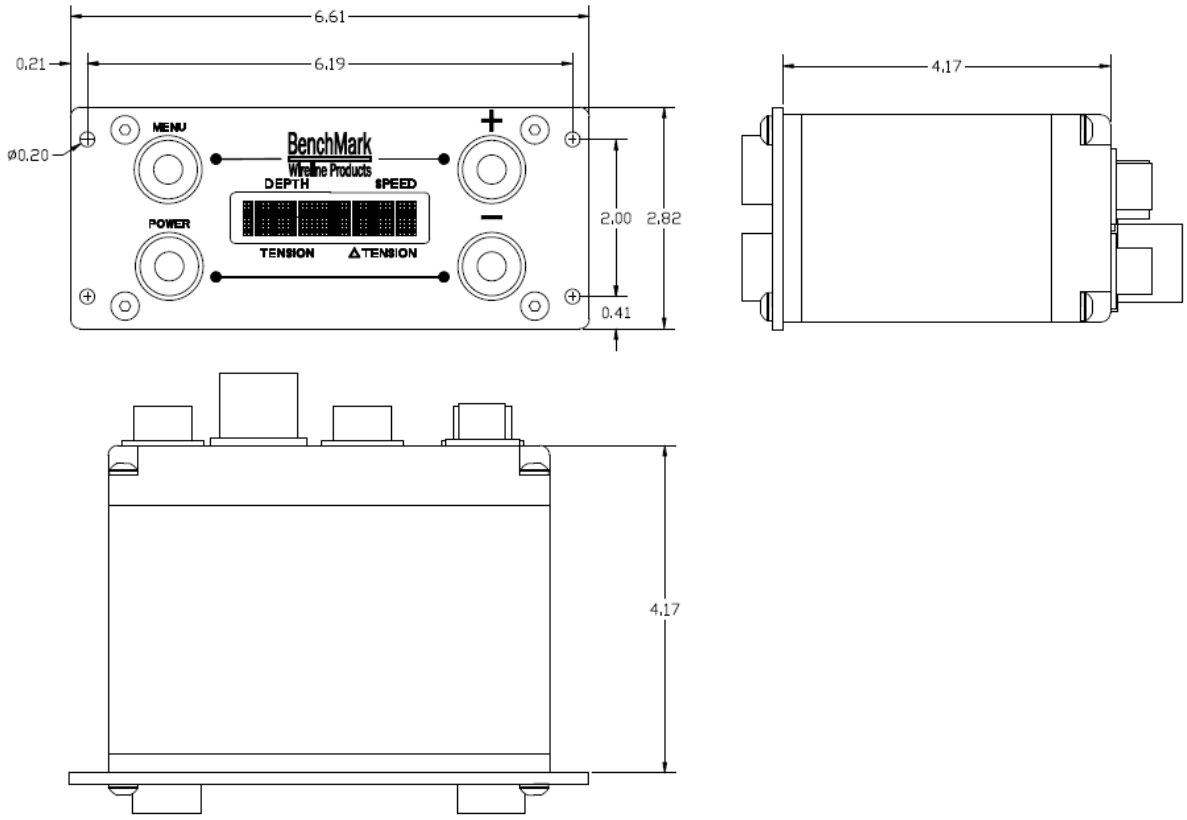
FRONT VIEW



SIDE VIEW

7.0 SPECIFICATIONS

7.1 MECHANICAL



Material	Aluminum, anodized
Weight	1.5 lbs (.68 kg)
Mounting	4 × .019 holes fixing centers: 6.19” (19.05 cm) from side, 2” (5.08 cm) from top/bottom.

7.2 ENVIRONMENTAL

IP Rating	54
Temperature	0 to + 40 ° Centigrade
Humidity	10% - 80% RH non-condensing.

7.3 ELECTRICAL

Input power Voltage	12 – 24 VDC
Input power current	0.4 A

7.4 BATTERIES

Battery	2100 mAh
Voltage	1.2 V NIMH
Lifetime	Approx. 5 years (depending on usage)

The batteries are trickle charged when external power is connected to the unit. The batteries are fully charged after 3 hours. The batteries discharge if the unit is left unpowered for a few weeks.

7.5 POWER CONSUMPTION AND OPERATING TIME

Operating	10 mA (typical)
Magnetic pickup assembly	20 mA (remainder powers the display)
Tension transducer	0.50 mA (maximum)

7.6 DC POWER-INPUT

Power+	Pin A
GND	Pin B

DC connector spec: AM5KP063 -CONN KPT06E8-33S 3 SOCKET

7.7 DEPTH MEASUREMENT

Quadrature counts/revolution	4	
Measurement resolution	0.048 m	0.1573 ft
Display resolution	0.1 m	0.1 ft

7.8 LINE SPEED

Minimum Line Speed	0 ft/min
Maximum Line Speed	1200 ft/min

7.9 POWER MANAGEMENT

Power time-out with idle magnetic pickup	60 min

The battery voltage and charge current can be displayed by pressing enable and menu at the same time.

The voltage will be displayed as:

E 8180

8180 would be a battery voltage of 8.18 volts. When the battery reaches 8.4v the charge will stop.

The charge current will be displayed as:

A 310

310 would be a battery charge current of 310 ma.

The display will cycle between the voltage and current display as long as the buttons are being depressed.

The charge current is limited to between 250 ma and 350 ma.

8.0 PARTS LISTS AND DIAGRAMS

8.1 PARTS LISTS

LINE	P/N	DESCRIPTION	QTY	REF
1	ALS6M601	PANEL FRONT DEPTH/SPD/TENS	1	
2	ALS6M642	PANEL REAR DEPTH/SPD/TENS	1	
3	ALS6M603	CHASSIS DEPTH/SPD/TENS	1	
4	AMS4P935	MEMORY CARD 2GB SD	1	
9	ALS4P063	DISPLAY 2X16 NHD-0216B3Z-FL-GB	1	
10	ALS6A620E	PCB ASSY DEPTH TENSION BU	1	
11	ALS6P619	GLASS 3/16" X 1-3/8" X 3-1/8"	1	
13	ALS6M623	CLAMP LENS DEPTH/SPD/TENS	1	
18	AMS4P618	BATTERY 1.2V NIMH AA 2100MAH	6	
19	ALS8P041	HOLDER BATT 6AA W 9V SNAP CON	1	
20	AMS4P714	STRAP BATTERY 9V SNAP ON 6"LD	1	
21	ALS8M037	CLAMP BATTERY 6XAA BKUP TENSN	1	
27	ALS6P616	SWITCH PUSHBUTTON WATER PROOF	4	
31	AMS4P659	CONN TERMINAL RECPTACLE .25TAB	3	
35	AMS7P021	CONN 102398-4 AMP 12 POS PCB	1	
36	AMS7P023	CONN 102536-4 AMP 12 POS BACK	1	
37	AMS7P024	CONN 102681-1 AMP 12 POS FRONT	1	
40	AMS5P064	DUST CAP KPT8108C RECEPT	1	
41	AM5KP034	DUST CAP KPT8110C RECEPT	1	
42	AMS4P188	DUST CAP KPT8112C RECEPT	2	
43	AMS4P924	DUST CAP USB CONN MS TYPE	1	
44	AMS4P257	CONN KPT02E8-33P RECEPTACLE	1	
45	AMS4P170	CONN KPSE02E12-10P RECEPTACLE	1	
46	AM5KP056	CONN KPT02E10-6S RECEPTACLE	1	
48	AMS4P990	CONN USB MS TYPE PNL MNT PCB	1	
49	AMS4P171	CONN KPSE02E12-10S RECEPTACLE	1	
50	ALS6P085	SCREW 4-40 X 1/4 FH PHIL SST	14	
51	AMS8P091	SCREW 4-40 X 1/4 PHIL PAN SST	12	
52	AMS8P036	WASHER #4 LOCK SST	13	
54	AMS4P626	WASHER #4 FLAT NYLON	1	
55	C276P158	NUT 4-40 MACHINE SST	1	
56	C276P046	WASHER #6 LOCK SS	6	
57	ALS8P043	SCREW 6-32 X 2 PHIL PAN SST	2	
58	ALS6P036	SCREW 10-32 X 3/4 BTN HD SST	8	
59	C276P035	WASHER #10 LOCK SS	8	

8.1 PARTS LISTS continued

LINE	P/N	DESCRIPTION	QTY	REF
60	AMS1P040	SCREW 6-32 X 3/8 PHIL PAN SST	4	
61	AMS4P879	SCREW 2-56 X 1/4 PHIL PAN SST	4	
62	ALS8P042	SPACER ROUND PHENLC #6 X 1-1/2	2	
63	ALS6P015	STANDOFF 6-32 X 7/16 M/F BRS	4	
65	C276P331	SCREW 6-32 X 1/2 PHIL PAN SST	4	
67	ALS1P027	WASHER #2 FLAT SST	4	
71	AM5KP123	O-RING 2-033 BUNA N	1	
72	AM5KP072	O-RING 2-046 BUNA N MMD COVER	2	
73	ALS6P037	O-RING 2-037 BUNA N 70D	1	
74	AM5KP219	O-RING 2-019 BUNA N 70D	3	
75	ALS6P013	O-RING 2-013 BUNA N 70D	1	
76	C276P041	O-RING 2-017 BUNA N	5	
77	AMS4P921	O-RING 2-021 BUNA N 70D	1	